Bob, Jeff thought you might want to look this over. One additional concern over winter drawdown would be the concentration of fish in winter where they would be subjected to extensive fishing pressure. This was less of a concern in the Mondeaux because it was not in an urbanized area.

Fishery Concerns at the Mondeaux flowage. Prepared by Ron Crunkilton, Assistant Professor, University of Wisconsin-Stevens Point.

The responses below pertain to questions asked of the Mondeaux Panel of Experts that relate to effects of altering water levels on the fishery in the flowage. The responses are based solely on the information provided and the professional experience of the author.

Question II G. Will raising the water level 2 feet affect the fishery?

A permanent 2 foot increase in the water level will not appreciably affect the fishery other than providing additional habitat similar to that already present. The configuration of the shoreline is such that an additional 2 feet of water will not significantly change the proportion of shallow water habitat available for use by fish. An additional 2 feet of water in "dark water" years would result in more open water in areas that are now less than 4 feet in depth which would increase the amount of fishable water. In "clear water" years, in areas that are now less than 4 feet, an additional 2 feet of water would have little effect on the amount of fishable water.

Question III A-C, E, How do drawdowns affect fish ... ?

Drawdowns affect fish populations directly by forcing fish into deeper water and indirectly by controlling aquatic vegetation. Aquatic vegetation is desirable and necessary to support a viable sport fishery. Generally, 10-20 % coverage of a lake is considered ideal, although this figure could vary considerably depending on other lake characteristics. Excessive aquatic vegetation favors recruitment of prey species. Prey species such as bluegill proliferate rapidly in lakes with abundant aquatic vegetation because their major food (aquatic invertebrates) are most abundant there and because the cover provides protection from predators. Growth, however, slows as the population increases because food resources become limiting. An over-abundance of small fish are produced.

Excessive aquatic vegetation can be detrimental to predator recruitment because it often results in an overabundance of prey. Prey species such as bluegill can feed freely on eggs of other fish and may limit the population of some predatory fish. The problem can be especially severe for species such as northern pike which broadcast their eggs in shallow vegetated areas where prey are abundant. Excessive vegetation may also limit growth of predators. Northern pike and largemouth bass cannot effectively feed on prey in weed-choked waters. Growth slows and fish may starve with an abundance of seemingly available food.

Drawdown typically has an effect of reducing overabundant prey by forcing fish from shallow water with abundant cover to

deeper water without cover where predators can more effectively feed. Growth increases in prey as well as predators because more food is made available to fewer fish. The theoretical result is larger fish available to anglers. The fish survey records from the Mondeaux provide ample evidence that the size of prey (bluegill) increases in years following drawdown. The information concerning northern pike and largemouth bass is inconclusive. Excessive variability in the data make it impossible to recognize any trends that might be present. I would not expect any adverse effects from drawdown on reproduction of early spawners such as northern pike as long as water levels were returned to normal prior to spawning. Under natural conditions in streams fish are often confined to isolated pools throughout the winter months with no apparent ill effects the following spring, however, a complete year-class failure could result if fish did not have access to spawning substrate at the appropriate time.

Year-round drawdown would result in a significant stress on the fishery. Many species would fail to reproduce and competition for the reduced food base and habitat would increase greatly. There is, however, ample evidence from other studies in the Midwest to suggest that such drastic perturbations may rejuvenate some sport fisheries in aging impoundments. Sport fisheries in many midwestern impoundments generally peak within 10 years of filling. Older impoundments generally favor fish species that are less acceptable to anglers and fisheries managers have been investigating the use of new ways to reverse this phenomenon. Extended drawdowns have a potential to control undesirable fish populations and in conjunction with selective restocking may be an effective tool for maintaining a quality sport fishery in older impoundments.

The Mondeaux flowage could benefit from a more intensive approach to the collection of fishery data. The method used to assess fish populations is based on catch per unit effort. Although this method allows comparisons over time, it does not provide an estimate of total standing crop. A larger deficiency is that the reliability of the data cannot be assessed. A catch and release population estimation technique would allow calculation of a confidence interval which would provide some indication of the reliability of the data. This technique would more than double the time commitment by biologists to survey this lake, but considering the regional interest in this fishery it would appear to be a sound investment.